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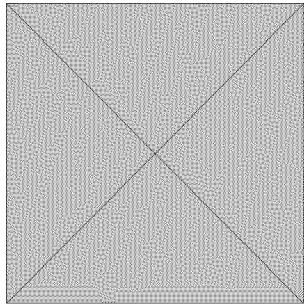
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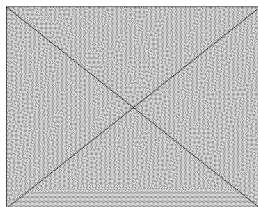
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Mine Closure Criteria–Mere Pebbles in the Wind

January 22, 2011 by [Jack Caldwell](#)



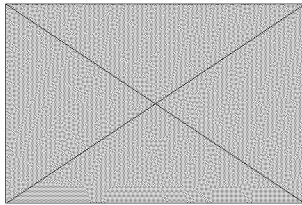
Here to end the week are a few ruminations on closure criteria for mines. Not definitive, nor exhaustive, but fascinating. I wonder which ones they will adopt for the Pebble Mine?



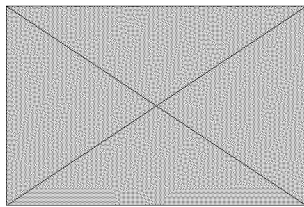
The Western Australia Department of Mines and Petroleum and the Environmental Protection Authority in mid-2010 issued draft mine closure criteria. If adopted these criteria will govern mine closure in Western Australia. The basic requirements are:

- Reinstatement of natural ecosystems as similar as possible to the original ecosystem.
- Develop an alternative land use with higher beneficial uses than the pre-mining land use.
- Reinstatement of the pre-mining land use.
- Develop an alternative land use with other beneficial uses than the pre-mining land use.

In addition, site specific criteria are required to be:



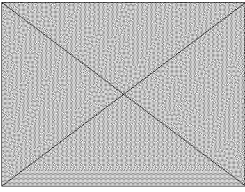
- Specific enough to reflect a unique set of environmental, social and economic circumstances;
- Flexible enough to adapt to changing circumstances without compromising objectives;
- Include environmental indicators suitable for demonstrating that rehabilitation trends are heading in the right direction;
- ☐ Undergo periodic review resulting in modification if required due to changed circumstances or improved knowledge; and
- Based on targeted research which results in more informed decisions.



This all sounds well and good, but it is very vague and flexible. Maybe that is exactly what is intended: provide the mining industry with the chance to select and do the right thing unencumbered by stringent regulations.

At this [link](#) is a document on mine closure put out by the Australians. Here is what they say of mine closure

- Plan, design, operate and close operations in a manner that enhances sustainable development.
- Consult with interested and affected parties in the identification, assessment and management of significant social, health, safety, environmental and economic impacts associated with our activities.
- Inform potentially affected parties at significant risks from mining, minerals and metals operations and of the measures that to be taken to manage the potential risks effectively.
- Contribute to community development from project development through closure in collaboration with host communities and their representatives.



In Ontario the requirements for mine closure include “consideration” of four key objectives:

- Protect public health and safety
- Alleviate or eliminate environmental damage
- Achieve a productive use of the land, or a return to its original condition or an acceptable alternative
- To the extent achievable, provide for sustainability of social and economic benefits resulting from mine development and operations.

In undertaking your “consideration” you are required to think of the following issues:

- Physical stability – buildings, structures, workings, pit slopes, underground openings etc. must be stable and not move so as to eliminate any hazard to the public health and safety or to prevent material erosion of the terrestrial or aquatic environment. Engineered structures must not deteriorate or fail.
- Geochemical stability – minerals, metals and ‘other’ contaminants must be stable, that is, must not leach and/or migrate into the receiving environment at concentrations that are harmful. Weathering oxidation and leaching processes must not transport contaminants, in excessive concentrations, into the environment.
- Surface waters and groundwater must be protected against adverse environmental impacts resulting from mining and processing activities.
- Land use – the closed mine site should be rehabilitated to pre-mining conditions or conditions that are compatible with the surrounding lands or achieve an agreed alternative productive land use. Generally the former requires the land to be aesthetically similar to the surroundings and capable of supporting a self-sustaining ecosystem typical of the area.
- Sustainable development – elements of mine development that contribute to (impact) the sustainability of social and economic benefit, post mining, should be maintained and transferred to succeeding custodians.

Again well-sounding, but so vague as to be susceptible to manipulation by lawyers and corporate interests.

The following are from the Nevada mine closure regulations and guidance document:

- When faced with hardrock mining reclamation, including closure, the Authorized Officer must ensure decisions will not result in unnecessary or undue degradation of the public lands.
- All actions must comply with the appropriate federal and state laws, and consistent with BLM’s multiple use responsibilities under the Federal Land Policy and Management Act (FLPMA).

- Reclamation decisions need to be coordinated and made in collaboration with the State regulatory agencies responsible for the permitting and oversight of mine reclamation, including closure activities.
- The BLM must ensure that activities such as long-term or perpetual maintenance of vegetation and/or wetlands, to include monitoring are provided for when these elements are part of fluid management or site stabilization. Fence maintenance, grazing management, weed invasion or increased salinity have all adversely impacted vegetation at reclamation sites, consequently these elements must all be considered in the long-term planning.
- The BLM field specialists and managers need to understand and consider all the technical issues associated with hardrock mine reclamation, including closure activities and the long-term implications of closure, while ensuring that reclamation, including closure activities, is conducted in a timely and effective manner.

Thus begins the Wisconsin Mining Information Fact Sheet *Reclamation and long-Term Care Requirements for Metallic Mining Sites in Wisconsin.*

“Successful reclamation means the restoration of all areas disturbed by mining activities including aspects of the mine itself, waste disposal areas, buildings, and roads and utility corridors. It is the product of thorough planning and execution of a well-conceived reclamation plan. Restoration means returning of the site to a condition that minimizes erosion and sedimentation, supports productive and diverse plant and animal communities and allows for the desired post-mining land use.”

In late 2005, the Montana Environmental Quality Council proposed this requirement for a mine reclamation plan:

The reclamation plan must conclusively demonstrate that, after .. [two years] ... no treatment of surface or ground water for carcinogens or toxins will be required to meet water quality standard at the point of discharge.

In early 2006, the Board of Environmental Review amended the language of the proposed rule change to lower the standard of proof that water treatment would not be required beyond two years from “conclusively demonstrate” to “demonstrate by clear and convincing evidence.” This was considered to reduce the 100 percent guarantee to a 70 percent probability.

In a study of the economic impact of this regulation, is this conclusion:

As a result of adopting the proposed rule as amended in January 2006, an estimated 50 to 90 percent of future metal mining economic output and 10 to 25 percent of future industrial mineral mining economic output in Montana would be prevented from developing... Overall, these two mining sectors comprise less than 1.5 percent of Montana’s total economy in terms of jobs,

wages, economic output and tax revenue. Therefore, the state economy as a whole would not be significantly affected by the proposed rule. However, mining's prominent history in Montana culture, its concentration in select counties, and the fact that mining jobs are high-paying would ensure that localized significant effects would occur.

The proposal was tabled indefinitely when the Montana Department of Environmental Quality came out against it. The bill in Idaho has been referred to a committee for further study.

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